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No. 1255

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CONTENTS

POST HARVEST CROP PROCESSING

Grain Elevator Program in Siberia, Far East Reviewed
(P. Merkulov; MUKOMOL'NO-ELEVATORNAYA I KOMBIKORMOVAYA PROMYSHLENNOST', Aug 80) 1

Grain Transport Progress, Problems Reviewed
(A. Ivanov; ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV, Aug 80) 8

Carelessness, Misappropriation of Grain Discussed
(F. Selyukov, V. Kalashnik; SEL'SKOYE KHOZYAYSTVO ROSSII, Aug 80) 13

LIVESTOCK

Development of Industrial Poultry Raising in USSR Discussed
(V.N. Annenkov; MYASNAYA INDUSTRIYA SSSR, Apr 80) .. 17

AGRO-ECONOMICS AND ORGANIZATION

Meat, Vegetable Production in Chelyabinskaya Oblast Personal Plots
(V. Ishchenko; IZVESTIYA, 23 Sep 80) 25

TILLING AND CROPPING TECHNOLOGY

Grain Crop Development in Virgin Lands of Kazakhstan, Siberia
(A. Barayev; PRAVDA, 19 Aug 80) 28

History of Nonchernozem Cereal Crops Related
(E. Nettevich; SEL'SKAYA NOV', Aug 80) 33

Use of Aviation for Agricultural Purposes in Kazakhstan
(Mikhail Georgiyevich Motoriko Interview;
VOZDUSHNYY TRANSPORT, 26 Aug 80) 39

Measures for Combating Weeds in Moldavian SSR Discussed
(A. Lisovskiy; SOVETSKAYA MOLDAVIYA, 5 Aug 80) 42

POST HARVEST CROP PROCESSING

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GRAIN ELEVATOR PROGRAM IN SIBERIA, FAR EAST REVIEWED

Moscow MUKOMOL'NO-ELEVATORNAYA I KOMBIKORMOVAYA PROMYSHLENNOST' in Russian No 8, Aug 80 pp 1-3

[Article by P. Merkulov, RSFSR minister of Procurement: "Developing the Material Base of Enterprises in Siberia and the Far East"]

[Text] The growth of production strength in Siberia and the Soviet Far East has been the basis for a significant increase in the population of this region. One of the most important goals is to supply this population with foodstuffs and to improve the quality and assortment of consumer goods. Of primary importance is supplying the workers of Siberia and the Far East with high-quality grain and grain products and public animal husbandry with balanced concentrated feeds.

The grain farmers of Siberia and the Soviet Far East, in realizing the decisions of the March 1965 Plenum of the CPSU Central Committee, which provided the basis for the current agrarian policies of the CPSU, achieved considerable success in grain production. By broadly utilizing the achievements of science and progressive practices agricultural workers showed in their deeds that this zone has the possibility of cultivating a good harvest of grain of a high commodity and feed quality. Not too long ago the farmers of the Altay set themselves a goal of 100-poods of grain,whereas today many enterprises not only of this kray but of other rayons in Siberia as well harvest over 180 poods of grain per hectare. These high indicators are not single cases. The number of enterprises with high-quality farming increases from year to year. Here we should note that the wheat produced in some rayons of Siberia is in no way inferior in bread-baking qualities to the best Kuban' wheat.

The average annual deliveries of grain to the state from the enterprises of Siberia and the Far East have increased by 1.4 million tons. In the plans that have been established for the current year the proportion of grain procured from the enterprises of these economic rayons reaches 21 percent of the total procurement volume for the RSFSR.

The aforementioned indicators attest to the significant success of agricultural production in the rayons of Siberia and the Far East. However, it should be noted that in recent years the grain production volume in Siberia and especially in Eastern Siberia, has not increased.

In speaking before the party and economic aktiv of Novosibirskaya Oblast, the General Secretary of the CPSU Central Committee and the Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev, said: "I am sure that the management of Novosibirskaya Oblast as well as that of your neighbor--Altayskiy Kray, will make every effort to increase the production output of agricultural crops, and primarily of grains. You know how we value your hard wheat varieties." To members of the bureau of the Irkutskaya Oblast CPSU committee Comrade L. I. Brezhnev said, "Although yours is an industrial oblast you should not tolerate an extremely slow pace of agricultural development."

State interests require a significant growth in grain production in Siberia and the Far East, especially of wheat of groups I and II with a gluten content of no less than 25 percent, in those places where the necessary work is being done, where the collectives of enterprises are fighting for high-quality wheat, in those places where high indicators were achieved for growing productivity and better quality of grain delivered to the state. Thus, in 1979, for example, Omskaya Oblast procured 990,000 tons of grain of strong and of the more valuable varieties of wheat, which comprised 53.3 percent of the total delivery of soft wheat to the state. In Krasnoyarskiy Kray last year only 6.6 percent of the grain was soft wheat which could be used for quality grinding; in Irkutskaya Oblast--31.4 percent; in Novosibirskaya--25.9 percent; and in Tyumenskaya Oblast there was no such grain. Moreover, wheat arriving in grain-reception points from Irkutskaya and Chitinskaya oblasts usually contains many mineral admixtures and pebbles.

In the years that have passed since the March 1965 Plenum of the CPSU Central Committee, measures have been realized on the continued development of the material base of grain-reception enterprises located in Siberia and the Far East, on transforming them into highly mechanized modern establishments able to provide the uninterrupted reception of grain, its line treatment and its distribution into dependable grain storehouses.

In many enterprises complexly-mechanized technological lines for the reception and treatment of grain on flow-lines have been developed. During the Ninth Five-Year Plan and in the 4 years of the current plan a significant number of elevators has been built and equipped with highly productive transportation and technological equipment. Systems of automatic control and for the diagnostic measurement of the temperature of grain in silos have been installed.

During this period the capacity of elevators in Siberia has increased by over 1.6 times; in the Far East--by a factor of 3.4. The proportion of elevator capacities to total grain-storage capacity has increased from 17.6 to 26.7 percent in the enterprises of Western Siberia, from 8.7 to 14.3 percent in Eastern Siberia and from 14.0 to 36.6 percent in the Far East. Nevertheless, in these regions there is still a shortage of grain storage capacities and frequently the grain must be temporarily stored on platforms. In connection with this it is planned to build additional elevators in the rayons of Siberia and the Far East. The elevators will be built according to better designs which include highly productive transport (up to 350 tons per hour) and grain-drying equipment and increasing the grain reception area for trucks and for loading and unloading railroad boxcars.

In addition to the building of new elevators, older ones are rebuilt and technological and transport communications are improved.

While considering that grain-reception enterprises located in Siberia and in the Far East receive large quantities of very moist grain and that timely and correct drying will have a decisive significance in the preservation of the grain, a great deal of attention is given to the development of grain-drying capacities. A great deal of work has been done to modernize dryers and to replace low-productivity pit grain dryers with high-productivity and economic recirculating dryers. As a result, during the years of the Ninth and the 4 years of the 10th five-year plans the capacities of recirculating grain dryers increased by a factor of 3 in the enterprises of Western Siberia, by a factor of 2 in Eastern Siberia and by a factor of 8 in the Far East.

At the present time the grain-reception enterprises of Western Siberia have at their disposal grain-drying capacities enabling them to dry 11.5 million planned tons of grain per month; of the Far East--1.6 million planned tons (with a decrease in moisture content from 20 to 14 percent).

Grain-reception enterprises have created a larger area for the reception and loading of grain. In the rayons of Western Siberia there are over 2,000 mechanized installations for the reception of grain from trucks. Of these, 800 are for unloading KamAZ trucks. In Eastern Siberia there are 820 and 400 and in the Far East--205 and 25 respectively.

The proper organization of loading and unloading of railroad boxcars is of considerable importance for the enterprises of Siberia and the Far East. A significant amount has been done to create improved conditions for unloading and receiving grain and agricultural products from railroad cars. However, the idleness of cars in some enterprises significantly surpasses existing norms. In addition to providing enterprises with the means of mechanization and with raising the effectiveness of their use, the efforts of collectives must be directed at improving the organization of transportation work as a whole and at raising the responsibility of individuals for timely and uninterrupted loading and unloading operations.

The flour-milling and groats enterprises in the rayons of Siberia and the Far East are solving great and complex tasks. In recent years there has been a significant increase in the production of flour and groats as well as an improvement in their assortment and quality. In 1971-1979 the production capacities of flour-milling enterprises in Siberia and the Far East increased by 2,850 tons of grain processed daily, including in Eastern Siberia--970 tons per day, in Western Siberia--1,305 tons per day, and in the Far East--by 575 tons per day.

In order to satisfy the growing needs of the population for high-quality foodstuffs, the flour-milling industry of the RSFSR has increased the production of high-quality flour from year to year. During the years of the ninth and 10th five-year plans the production of flour of the highest quality increased by a factor of 1.7 in the flour-milling enterprises of Siberia and the Far East. The annual production of flour of the highest or first classes, which are most in demand by the population, increased by 541,000 tons, or by 37 percent.

One of the most important goals of the workers of the flour-milling industry remains the more efficient utilization of grain. For this purpose it is essential to constantly improve the organization and management of technological processes.

In coming years it is planned to implement a number of measures to further develop the flour-milling industry in the rayons of Siberia and the Far East in order to more fully satisfy the demands of the population and industry for flour and to curtail its import into these rayons. Thus, it is planned to introduce quality milling plants in Achinsk of Krasnoyarskiy Kray, in Chita and Sayansk of Irkutskaya Oblast, in Spask of the Far Primorskiy Kray and in Khabarovsk and Belogorsk of Amurskaya Oblast. In addition, it is planned to increase production capacities by means of the reconstruction and technical reequipping of milling plants in Biysk of Altayskiy Kray, in Novosibirsk, Omsk and Mar'yanovka of Omskaya Oblast and in Krasnoyarsk and Kansk of Krasnoyarskiy Kray.

Because of the constant concern and attention of the party and state as well as of the aid rendered by local party and soviet organs, in recent years there have been significant achievements in the development of the mixed-fodder industry in the rayons of Siberia and the Far East. As a result of the building of new plants and of the renovation and expansion of existing plants, the production capacities of mixed-fodder enterprises increased by 6,800 tons per day during the ninth and 10th five-year plans, securing an annual output of 6.0 million tons of mixed fodder. The mixed-fodder industry developed at the highest pace in Altayskiy, Krasnoyarskiy, Khabarovskiy, and Primorskiy krays and in Novosibirskaya, Kemerovskaya and Omskaya oblasts.

In fulfilling the goal of further increasing the production of mixed fodder in order to more fully satisfy the needs of public animal husbandry for these highly productive feeds, the output of mixed fodder in Siberia by 1985 must significantly surpass 1980 production.

To curtail the volume of grain and mixed-fodder shipments by trucks it is planned to more extensively introduce the two-stage production of mixed fodder. Here protein-vitamin supplements are produced in state enterprises whereas mixed fodders are produced directly in kolkhozes and sovkhozes by means of crushing their own grain and mixing it with protein-vitamin supplements at a fixed ratio.

The high level of technical development and the introduction of progressive technology in flour-milling and groats mixed-fodder enterprises has required the modernization of the energy base. At the present time almost all enterprises are supplied with electrical energy from state electrical stations. In the rayons of Siberia there are over 160 elevators that are equipped with installations for automatic remote control of equipment (DAU), about 300 grain dryers equipped with automatic systems, 200 elevators in which automatic temperature controls of ensilaged grain are being installed and 50 mixed-fodder plants in which multi-component dosages have been introduced.

In connection with the development of the rayons of Siberia and the Far East and the growing demand for engineering and technical workers and trained working cadres for the enterprises of this zone, measures have been taken in recent years to increase the training of specialists of the middle link, to increase the training and retraining of cadres of mass professions and to improve the quality of education. The educational-material base of technical schools and professional-technical institutes of the RSFSR Ministry of Procurement is growing. In 1980-1981 the introduction of a technical institute is planned for the city of Kamen-na-Obi of Altayskiy Kray for 480 persons, and of an educational-laboratory section of the Omsk technical institute for 600 persons. A second residence hall is planned for students of the Achinskiy technical institute. In the future it is planned to build an educational-laboratory section in the Achinskiy and Biyskiy technical institutes and to expand the educational base of the Blagoveshchenskiy PTU [Vocational and technical school]. With the aim of training specialists from the local population additional training sessions have been organized for technologists of the flour-milling and groats and mixed-fodder industries and for bookkeepers in the Omskiy and Biyskiy technical institutes. Measures are being realized on securing cadres. In this area active work is being done by the Altay administration of grain products, in many enterprises of which dispensaries are being organized, plans for the introduction into operation of residential buildings are being overfulfilled and which have a total of 27 kindergartens; by the Cheluabinsk administration of grain products, which is even overfulfilling its plans for capital investments into residential building, for the organization of sanitary-spa treatments for which two bedroom wings have been built in two sanitoriums. This administration has also created a rest and relaxation base in the suburbs. Here many of the enterprises have kindergartens and well-equipped health points have been organized in large enterprises. The administration gives help to workers in the development of private plots. All of this sharply curtailed the turnover of cadres. The experience of the Altay and Chelyabinsk administrations of grain products should be widely copied.

In developing plans for the continued development of the material-technical base of the enterprises on storing and processing grain in Siberia and the Far East, consideration is given to the changes in the economy and in the distribution of production forces as a result of the start of operations of the Baykal-Amur railroad. GOSNIIsibpromzernoproyekt [Siberian state scientific and research institute for the planning of the grain industry] jointly with TsNIIPromzernoproyekt [Central scientific and research institute on planning for the grain industry] have worked out a scheme for the distribution of structures to store and process grain tin the BAM [Baykal-Amur trunk line] zone. The scheme includes specific conditions such as the size of the population, its growth pace in coming years and in the long-range future, transportation and economic ties of the BAM zone with the zone of the existing railroad line as well as the development and distribution of the flour-milling and mixed-fodder industries in the oblasts of Eastern Siberia and the Far East.

To further improve work conditions with grain the RSFSR Ministry of Procurement is recruiting scientific research institutes such as VNIIZ [All-union scientific research institute of grain and grain products], VNIIKP [All-union scientific research institute of the canning industry], TsNIIPromzernoproyekt and others. The basic directions for scientific research are: the development of methods and means of raising the resistance of grain and grain products during storage, including the use of thermal and chemical treatment and artificial cold; improving the technology of flour-milling, groats and mixed-fodder production, the development of new technological and transportation equipment; the mechanization and automation of technological processes and loading-unloading operations; the development of a branch automated system of controls, of methods and means for evaluating the quality of raw materials and products.

Nevertheless, we should recognize that a number of problems, such as the complex mechanization of loading-unloading operations with raw materials that are difficult to pour or with packaged goods as well as decreasing fire and explosion hazards in enterprises, the protection of the production and surrounding environment from dust, noise, vibration, and the creation of favorable meteorological conditions in production facilities are still being decided slowly.

We must also mention the difficulties experienced by enterprises located in Siberia and the Far East regarding the continued development and improvement of the material base. Thus, there are still no highly-productive and effective means for cleaning grain. The separators that are manufactured by industry are of low productivity and do not secure the necessary cleaning and sorting of grain in a flow line. To bring grain up to the required condition it is necessary to pass it through grain-cleaning equipment several times.

A problem area in preserving grain that is received from kolkhozes and sovkhozes is drying. During the period of mass deliveries enterprises do not have time to thoroughly dry grain and oil-bearing seed in a flow-line. This results in an increase in drying time with all of the unfavorable consequences arising from this.

Already today there is a significant gap between the reception capability of installations and the capacities of grain dryers. The productivity of transport equipment as a rule equals 175-350 tons per hour, whereas the capacity of grain dryers does not exceed 50 tons per hour.

Under the conditions of Siberia and the Far East, where the grain that grain-reception enterprises receive reaches 30-35 percent moisture content or in some cases--45 percent, this type of gap is experienced particularly acutely.

Considering that an increase in drying capacity by means of installing several units is not efficient and not always possible, it is considered efficient to search for principally new methods of drying in order to in the future develop new dryer designs that will enable us to flow-line dry 3,000-4,000 tons of grain per day while decreasing moisture content from 30-35 percent to 14 percent.

The lack of opportunity to quickly determine grain quality causes difficulty during grain reception. The equipment and methods used today are related to the expenditure of a significant quantity of time and manual labor. There is still the problem of means for the express determination of the indicators of the quality of grain and oil-bearing seed such as moisture content, quantity and quality of gluten, the glassiness of strong and hard wheats, protein content of grains and pulse crops, the proportion of acid in the oil of sunflowers, etc.

Still unsolved is the question of increasing the production and procurement of wheat, oats, millet and buckwheat in Siberia that is both high in quality and in quantity in order to satisfy the demands of the flour-milling and groats industry of this region.

Serious difficulties arise in supplying enterprises of the mixed-fodder industry with a number of components. In particular, it is essential to expand the production and delivery to Siberian rayons of vitaminous meal made from tree foliage.

The mixed-fodder industry is in need of portable equipment for the express determination of the content of protein, gluten,gravel,salt, potassium, phosphorus, and other nutritive and biologically-active substances in raw materials that have been delivered for processing.

The RSFSR Ministry of Procurement needs the help of the Siberian division of the USSR Academy of Sciences in the continued development of the material base of grain-reception enterprises, in increasing the production capacities of flour-milling, groats and mixed-fodder enterprises located in Siberia and the Far East, and in raising the effectiveness of production and the quality of work. Only through common efforts by specialists of the procurement system, scientists and collectives of enterprises on the storage and processing of grain will it be possible to fulfill the most important goals established by the 25th CPSU Congress and the July 1978 Plenum of the CPSU Central Committee regarding securing dependable supplies of foodstuffs and agricultural raw materials in order to more fully meet the needs of the Soviet people.

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POST HARVEST CROP PROCESSING

GRAIN TRANSPORT PROGRESS, PROBLEMS REVIEWED

Moscow ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 8, Aug 80 pp 26-27

[Article by A. Ivanov, chief specialist of the Department of Receiving, Distrubuting and Preserving Grain Products of Glavelevatorprom [Main Administration of the Elevator Industry] of the USSR Ministry of Procurement: "Transporting Grain According to Hourly Schedules"]

[Text] In recent years grain shipments during the grain procurement period have been realized by means of hourly schedules in many grain-collection enterprises. Electronic computers were utilized broadly for this purpose. This type of transportation organization enables us to curtail the procurement schedule, to deliver more high-quality grain to the state and to significantly increase the effectiveness of utilizing the trucks and technical bases of grain-reception enterprises.

In 1979 grain shipments according to hourly schedules were planned in 711 grain-collection enterprises, including 102 in the RSFSR, 450 in the Ukrainian SSR, 145 in the Kazakh SSR, 8 in the Belorussian SSR and 6 in the Moldavian SSR. Moreover, in some oblasts the schedules were based on a preliminary determination of grain quality with a consideration of operations by enterprises according to technological maps.

In the RSFSR centralized control of grain shipments according to hourly schedules was realized in Krasnodarskiy and Altayskiy krays and in Orenburgskaya, Kurganskaya, Chelyabinskaya and Kuybyshevskaya oblasts.

In Krasnodarskiy Kray the central kray operation group under the direction of the deputy chairman of the kray executive committee managed all of the grain shipment operations. In eight kray rayons 528 centralized auto-detachments worked on shipping grain from threshing floors to grain-collection enterprises. These detachments included 6,220 large-capacity trucks with 4,115 tractor-trailer units. As a result of daily planning of shipments the output per truck increased by 11.6 percent, and the profits of truck shipment organizations comprised 93,000 rubles.

In Altayskiy Kray this method was utilized in five rayons in seven grain-collection enterprises--Pospelikhinskoye, Topchikhinskoye, Ust-Kalmanskoye, Shipunovskoye, Beloglazovskoye, Khlopunovskoye and Tselinnoye. Twenty-one percent of the total volume of grain in the kray was shipped according to hourly schedules, whereas only 6.2 percent of the total number of trucks were occupied in this work.

In Orenburgskaya Oblast grain shipments according to hourly schedules were conducted in 11 rayons utilizing 6,292 trucks, including 2,292 tractor-trailers. Grain shipments were directed by operational groups and rayon dispatcher points. A total of 3.5 million tons of grain was transported with an average daily delivery of about 100,000 tons. The procurement schedule was shortened by 5 days.

In Kurganskaya Oblast hourly schedules were utilized in Kurganskiy, Dalmatovskiy, Kurtamyshskiy and Tselinnyy rayons. The average time for loading and unloading trucks in the oblast comprised 1.8 hours as compared with 0.8 hours when hourly schedules were in effect. The average daily productivity per truck was 20 and 32 tons respectively. The economic effectiveness of truck shipment organizations comprised 61,600 rubles when grain was shipped according to hourly schedules.

In Chelyabinskaya Oblast grain shipments according to this method were organized at the Varnenskiy, Troitskiy and Nizhneuvel'skiy elevators and in the Oktyabr'skoye, Kizil'skoye, Chesmenskoye and Nagaybakskoye grain-collection enterprises. Truck idleness during loading and unloading has been curtailed by 38 percent, the need for trucks has decreased by 60 units, and auto shipment expenses decreased by 75,000 rubles.

In Kuybyshevskaya Oblast daily operational planning of grain shipments from the threshing floors of kolkhozes and sovkhozes to grain-collection enterprises was implemented in nine rayons. The decrease in shipment expenses comprised 147,000 rubles.

In the Kazakh SSR technological maps on the reception, distribution and treatment of grain were developed prior to grain procurement in most grain-reception enterprises of the northern oblasts in the republic. Hourly schedules for shipping grain from the threshing floors of kolkhozes and sovkhozes to grain-collection enterprises were developed jointly with transportation organizations.

In Tselinogradskaya Oblast 17 large grain-collection enterprises participated in the centralized shipment of grain according to hourly schedules. As a result of the introduction of this method, 1,037 trucks were freed. The effectiveness of utilizing the technical base of grain-collection enterprises increased by 23 percent, and the economic effectiveness of decreasing operational expenses for truck use comprised 336,000 rubles.

In the oblast as a whole the introduction of this system decreased truck idleness by 1.8 times, which doubled their productivity.

The [illegible] Elevator of Kokchetavskaya Oblast received 60,000 tons of grain according to hourly schedules, which required 32 trucks, whereas in past years no fewer than 50 were required. The idleness of one truck during loading and unloading has dropped from 1.6 to 1 hour. The economic effectiveness of this for the shipping enterprise comprised 11,100 rubles.

In Semipalatinskaya Oblast the delivery of grain according to hourly schedules was implemented at the Bel'-Agachskiy and Urdzharskiy combines for grain products, at the [illegible], Charskiy and Kokpektinskiy grain-collection enterprises and at the Ayaguzskiy Elevator. The duration of procurement in comparison with preceding years was curtailed by 10 days and 47 trucks were made available. The economic effectiveness of the introduction of hourly schedules comprised 28,000 rubles.

In [illegible] Oblast the transport of grain according to hourly schedules was conducted at the Amankaragayskiy and Tobol'skiy elevators, for which two control centers were organized with four specialized truck detachments in each, each including 200 trucks. As a result of the use of automated control systems 40 trucks were made available for other work.

Grain shipments according to hourly schedules had a positive effect in Vostochno-Kazakhstanskaya Oblast. Thus, at the Azovskoye Enterprise 50 trucks with trailers were previously needed to deliver 50,000 tons of grain in the course of 20-25 days; now 35 are needed. At the Kharyuzovskoye Enterprise 40 trucks were made available.

In Ural'skaya Oblast hourly schedules were utilized at the Dzhambeytinskoye, [illegible], Furmanovskoye and [illegible] grain-collection enterprises. During the period of grain procurement this enabled us to free 37 trucks and to increase the economic effectiveness of truck enterprises up to 14,700 rubles.

In the Belorussian SSR grain shipments according to hourly schedules was very widespread. In 1978 with an increase in the volume of grain procurement of 20 percent as compared with the preceding year, shipments according to schedule enabled workers to curtail the number of trucks used by 8 percent. The centralized truck detachments delivered 71 percent of the total grain to grain-collection enterprises, and the output per truck increased from 7.9 to 10.3 tons per day, or by 31 percent.

At the same time, there were certain shortcomings in the work to introduce grain shipments according to hourly schedules. In many krays and oblasts such shipments were not organized at all. In a number of cases hourly schedules were composed only for trucks belonging to truck shipping organizations, whereas the trucks belonging to kolkhozes and sovkhozes and those from industrial enterprises that are borrowed during days off are not included in hourly schedules. All of this created certain difficulties in the organization of grain reception. It required the supplementary expansion of the means of unloading, resulted in the underutilization of equipment and decreased the effectiveness of shipping operations.

From the above it is apparent that the organization of grain shipments according to hourly schedules is of significant economic effectiveness, enables us to avoid lengthy storage of commodity grain on the threshing floors of kolkhozes and sovkhozes, to sharply curtail the idleness of trucks during loading and unloading, and to secure a high work effectiveness in grain-collection enterprises by means of uniform shipments, the uninterrupted operation of the technological line and the growth in the reception capacity of grain-collection enterprises. The consequences of all of this is to shorten the procurement schedule.

The ways of raising the effectiveness of utilizing truck shipping during harvesting operations were at the center of attention of the participants in the third all-union conference that was organized on the initiative of the USSR State Commission on Science and Technology. The conference took place in April 1980 in the city of Telavi, Georgian SSR.

Participating in the work of the conference were D. I. Patiashvili, secretary of the Central Committee of the Georgian CP, A. V. Kobaidze, first secretary of the Telavskiy Rayon committee of the Georgain CP and responsible workers of the councils of ministers of the USSR, RSFSR and Georgian SSR. Reports were presented at the conference by scientists, agricultural specialists and workers of Goskomsel'khoztekhnika [State committee of the agricultural equipment association], the USSR Ministry of Procurement, the RSFSR, Ukrainian SSR and Kazakh SSR ministries of automobile transport and workers of the USSR State Commission on Science and Technology.

In particular, there were reports on the experience of the Georgian SSR in organizing centralized management of grape harvesting, on the effectiveness of automated systems of centralized shipping controls during the 1979 harvest in the RSFSR, on progressive forms of organizing grain shipments in the Kazakh SSR, on the future of using mini-computers to control harvesting-transport-procurement processes and on directing harvesting operations with the use of aerospace methods.

At the conference it was noted that an automated system of central control for harvesting grains, sugar beets and grapes in 1979 was introduced in 223 rayons, including 124 rayons of 23 oblasts (krays) of the RSFSR, 81 rayons of 13 oblasts in the Kazakh SSR, 16 rayons of 8 oblasts in the Ukrainian SSR and two rayons of the Georgain SSR.

The total economic effectiveness of the introduction of the system in the oblasts of the RSFSR, the Ukraine, Kazakhstan and Georgia for harvesting grains, sugar beets and grapes comprised 2.84 million rubles.

The all-union conference resolved that the further dissemination of the progressive experience of utilizing an automated system of central control over harvesting-transport-procurement operations for harvesting grains, sugar beets, fruits and vegetables was expedient, primarily in those oblasts where large quantities of shipment resources are required to move the harvest.

This year the RSFSR Ministry of Automobile Transport plans to introduce centralized controls for grain shipments in 231 rayons of 35 oblasts in the republic. Seventy small carriages, 756 mobile and 41 stationary radio stations have been allocated for equipping control centers for deliveries of agricultural products.

The ministries of automobile transport of the Ukrainian SSR and the Kazakh SSR and the auto transport enterprises of Goskomsel'khoztekhnika are planning to introduce this system in most agricultural rayons.

The USSR Ministry of Procurement, in rendering great significance to this question, in early April of this year obliged the directors of the procurement ministries of union republics, the administration of grain products, grain-collection and grain-treatment enterprises to take measures toward the universal introduction of progressive experience regarding grain shipments according to hourly schedules. It suggested the introduction of a proposal that would be coordinated with auto-transport and agricultural organizations for examination by local party organs.

A consolidation of efforts by village workers, transportation workers and procurers will help us to complete the procurement of agricultural products rapidly and without losses during the current year, the final year of the 10th Five-Year Plan.

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POST HARVEST CROP PROCESSING

UDC 633.1.003

CARELESSNESS, MISAPPROPRIATION OF GRAIN DISCUSSED

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 8, Aug 80 pp 25-26

[Article by F. Selyukov, V. Kalashnik, workers of TsNIL [Central Scientific Research Laboratory] of USSR MVD [Ministry of Internal Affairs]: "Preserving the Harvest to the Final Grain"]

[Text] The preservation of the new harvest is secured long before the harvest operation itself, in the period when technology is being prepared for it. However, there are still instances in which this serious measure is not given the necessary attention. This happened last year, for example, in Olovyanninskiy Rayon of Chitinskaya Oblast. An examination showed that of 197 existing reapers only 126 were operational for the harvest, and that 38 were not serviced at all. For the same reasons 36 grain-harvesting combines were not able to participate in grain threshing here. Combine operators were not issued certificates of quality. Technical services links were not organized everywhere, and in those places where they were the return on them was not great. Many did not have welding equipment and the most important spare parts. This situation occurred because the production administration of agriculture did not exhibit demandingness and did not control the course and quality of technological services in enterprises. Many specialists had an indifferent attitude toward their obligations.

What are the consequences of harvesting with poorly-serviced technology? In 1978-1979 in Novosibirskaya Oblast several areas were examined through the joint efforts of the workers of the state statistical office and of the organs of internal affairs. What were the results? In the Zheleznodorozhnyy Sovkhoz alone on a 30-hectare rye field about 60 quintals of grain had remained.

There is no need to go into great detail about the carelessness in the preparation of combines, the advantages and necessity of control threshing, the order for examining and regulating the main working parts of harvesting technology. This journal has discussed this topic in great detail (SEL'SKOYE KHOZYAYSTVO ROSSII, No 7, 1978). But we should again emphasize the significance of sealing machines and of fulfilling the necessary measures to prepare areas for harvesting operations.

It is no secret that each year we find cases of mismanagement regarding the primary riches of our fatherland--grain. Frequently, overly mature grains are "threshed" by the wind, large areas of unmowed lands are covered with snow, and responsible parties involve themselves in cover-ups instead of correcting shortcomings. They attempt to obfuscate the actual state of affairs with all legal and illegal measures possible. This is where "tricks" with state accounts enter the picture--unharvested areas are not included in accounts, arson in stubble fields, the replowing of unharvested areas and many other things.

But whereas instances of such laxity are isolated cases, one cannot say this about misappropriation. Usually workers themselves involved in harvesting participate in this activity. Despite the fact that the grain that is found on threshing floors, in grain storage areas, in grain-reception points as well as on sections near roads used to transport the new harvest is guarded by deputy posts, by state and non-state police, by members of voluntary people's teams, by the people's control and by public workers, loopholes for theft are still found. Thus, Ye. Zolotenin, combine operator of the Belokurikhinskiy Sovkhoz, Smolenskiy Rayon, Altayskiy Kray, spent one harvesting day getting inebriated. In the evening he went into the field, threshed 540 kilograms of barley and took it home. Also tempted by the easy life were V. Agarkov, driver of the Altaysel'stroytrans [Altay agricultural building transport organization] motor pool V. Danilishing, worker of the Aleyskiy Sugar Plant and V. Golev, driver for the Troitskiy Sovkhoz. By utilizing the inadequacies in the accounts for grain arriving at the threshing floor, they sold over half a ton of wheat for vodka. Of course, all of them were tried for criminal activities and punished accordingly.

Another reason for theft is carelessness and a negligent attitude toward preserving socialist property. In the Vysokoye Sovkhoz of Ryazanskaya Oblast electrician M. Starshinov regulated searchlights on the grain threshing floor. After finishing work he saw that the guard, I. Lysov, was asleep, so he loaded 120 kilograms of wheat on his wagon and went home. It turns out that the control here was not very good, that the attitude toward the selection of cadres was irresponsible and that the work of vigilante groups was not organized properly.

In some cases the very guardians of order are not against enriching themselves through public property. In the Shlenskiy Sovkhoz of Orlovskaya Oblast guard A. Lomakina was found guilty of stealing 360 kilograms of wheat from the combine's bunker.

Thus, the atmosphere that encourages misappropriation depends on many factors. Here the most effective measures that prevent the development of such an atmosphere are crime prevention involving widespread elucidation of legal requirements and measures against violators of the laws. This should be given special attention.

The reasons for theft often involve an unthought-out system of controls and accounts of threshing. At the present time the grain that is delivered from the combine is determined by volume mass or bunker capacity. However, the mass of a cubic meter of product depends on many factors (moisture, weed infestation) and can fluctuate by 15 percent. At the same time the actual mass of the harvest is determined at the threshing floor, in storage enterprises and in other places where grain is stored permanently or temporarily. Naturally, this complicates controls over the preservation of grain during transport because "losses" en route are not included in the total harvest. These losses can be significant.

Many plunderers feel impunity as a result of the premeditated creation of surplus grain. The main way is to exaggerate the actual moisture and weed content. As a result of the incorrect determination of the quality of arriving grain there is a real possibility to write off a certain quantity of grain as if as losses. At fault here are the directors of enterprises, bookkeeping and accounts workers who interpret normative instructions and the orders of superior organizations in their own manner. Thus, in violation of Instruction Number 269-4, "On the Order of Calculating Agricultural Production in Kolkhozes and Sovkhozes," they frequently independently decide questions on the form of accounts documentation (register, invoice, badge, certificates, etc.) that is utilized to move grain from the combine to the threshing floor and from the threshing floor to the grain-reception point.

The observation of the legal foundations must be supplemented by well-organized accounts and controls. Let us take at least the commodity transport invoices. In many enterprises and rayons they are filled out differently. Sometimes they do not include the time the truck left the threshing floor, the time it arrived at the elevator, the time of unloading and even the approximate weight of the grain that is being transported. In the Kolkhoz imeni 40 let Oktyabrya of Volgogradskaya Oblast invoices were not even numbered and did not have the corresponding stamps. Inspectorates for the procurement and quality of agricultural products must eliminate this shortcoming and make invoices documents of strict accounts.

Another serious shortcoming is that grain shortages during truck shipments are not given the necessary attention. Neither the reasons for the losses nor the guilty parties are sought. Grain reception enterprises do not inform enterprise directors or agricultural administrations of these facts. At best, the weigher in the grain-reception point will call the enterprise with a request for information.

There are also serious shortcomings in the calculations of the harvest yield. Examinations have shown that state accounts are frequently composed not on the basis of primary documents, but according to the word of agronomists, tally clerks and other workers in farming. As a result in the majority of enterprises that were examined the actual amount of grain threshed was greater than according to accounts documents. In Novosibirskaya Oblast alone 3,255 quintals were not accounted for.

In many kolkhozes and sovkhozes the receipt of threshed grain is very poorly organized. It is realized according to the so-called storehouse weight, i.e. 10 percent is deducted from the quantity of bunker grain in consideration of admixtures of weeds and other crops. The most intolerable part of the situation is that this quantity is written off not according to actual wastes, but by means of calculation alone. Moreover, the aforementioned volumes are placed by enterprises into financial industrial plans ahead of time. In other words, one-tenth of the procured grain is written off.

Enterprises lose a great deal by delivering grain with a high moisture capacity as compared with base condition. In Novosibirskaya Oblast moisture content should be no more than 19 percent. Nevertheless, some of the grain that is delivered is moister and thus large sums are deducted from the USSR Ministry of Procurement for this purpose. Thus, during the last 2 years in the oblast as a whole deductions comprised over 6 million rubles.

Questions of preserving the valuable products of fields are not only economic but also political in nature. Their solution will facilitate an improvement in the well-being of the Soviet people. It is the duty of village workers and of all those who help with the harvest to collect and preserve the harvest to the very last grain.

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LIVESTOCK

UDC 636.5(47+57)"71"

DEVELOPMENT OF INDUSTRIAL POULTRY RAISING IN USSR DISCUSSED

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 4, Apr 80 pp 8-13

[Article by V.N. Annenkov, USSR Ptitseprom of USSR Ministry of Agriculture: "Development of Industrial Poultry Raising in USSR"]

[Text] In carrying out the agrarian policies of the party, adopted during the March (1965) Plenum of the CPSU Central Committee, the party, soviet and agricultural organs in the various areas carried out a great amount of work during the past 15 years in connection with converting poultry raising over to an industrial basis.

Prior to 1965, poultry raising in our country developed mainly in an extensive manner and was seasonal in nature. The principal production of poultry products was concentrated on relatively small farms of kolkhozes and sovkhozes and also on the private plots of the population. It is sufficient to mention that in 1964 more than 20,000 kolkhozes and 4,513 state farms were engaged in poultry raising operations. On the average, one kolkhoz raised 2,300 head of poultry and one sovkhoz -- 12,300 head. Of 456 million head of poultry throughout the country as a whole, 72 percent were concentrated on the private plots of the population and only 28 percent at kolkhozes and sovkhozes in the state sector. Such a situation within the branch resulted in low poultry productivity and also irregular production and supply of poultry products to the population throughout the year. The average egg production of hens on farms in the public sector was 117 per laying hen, with 80 percent of the eggs being produced during the spring and summer period. Approximately 26.7 billion eggs were produced at all categories of farms and of this amount only 7 billion or 26 percent were produced in the public sector; 764,000 tons of poultry meat in live weight, with 215,000 tons or 28 percent being produced in the public sector. In all, 117 eggs and 2.6 kilograms of poultry meat were produced per capita. The production of poultry products was unprofitable on a majority of the farms. Poultry were to be found throughout the country and yet poultry raising as an organized and controlled branch for supplying the populations of cities and industrial centers with eggs and poultry meat simply did not exist.

The radical reorganization of poultry raising in our country and the conversion of this branch over to an industrial basis were called for in the decisions handed down during the March (1965) Plenum of the CPSU Central Committee and in the decree of the CPSU Central Committee and the USSR Council of Ministers on the organization of egg and poultry meat production on an industrial basis.

The principal trends for the development of intensive industrial poultry raising were formulated in these documents and towards this end a specialized system of poultry farms subordinate to USSR Ptitseprom [Administration for the Poultry Raising Industry] of the USSR Ministry of Agriculture was created. Five hundred and seventy six small poultry farms and 1,067 poultry-incubator stations were turned over to USSR Ptitseprom in 1965. It was at this time that work of a planned, comprehensive and laborious nature commenced in connection with converting the branch over to an industrial basis.

This applied first of all to the poultry breeding work. Prior to the creation of USSR Ptitseprom, our country did not have highly productive lines or crosses for producing poultry hybrids at its disposal. Thus an all-union trust of poultry breeding plants was organized for the purpose of creating a base for the radical reorganization of breeding work in poultry raising. Twenty of the best breeding farms in the country were turned over to this trust and measures were undertaken aimed at expanding and modernizing them.

During the 1966-1979 period, 200,000 head of day-old young stock representing the best foreign crosses in chickens, ducks, turkeys and geese were imported for achieving a rapid and general replacement of low productivity poultry with highly productive lines and hybrids.

The imported poultry were reproduced in quantity and underwent further improvements at breeding plants and the experimental farms of scientific institutes, from which points they were shipped to industrial enterprises in all of the republics. Based upon the imported and domestic pedigree poultry, new domestic poultry lines and crosses were created and introduced into operations in our country. Crosses of the Belarus, Start and Borki egg-laying hens, the Broyler-6 meat poultry, the X-11 duck and the White North Caucasus turkey have high productivity indicators and are presently being employed extensively in industrial poultry raising.

The measures undertaken have made it possible to commence on a rapid basis the planned sale of pedigree products, to organize the production of hybrid poultry and to solve the problem of supplying the industrial farms with hybrid egg-laying poultry. Today the kolkhoz and sovkhoz farms and the private plots of the population are being supplied with highly productive hybrid and line young stock. Over the past 15 years, more than 8.3 billion pedigree eggs have been sold to kolkhozes, sovkhozes and poultry-incubator stations. The annual sale of pedigree eggs has increased from 66 million in 1966 to 1.26 billion in 1979.

A great deal has been accomplished with regard to creating a logistical base for poultry raising. During the past three five-year plans, the state invested 12 billion rubles worth of capital investments in the development of poultry raising. This made it possible to increase the value of the fixed productive capital of an agricultural nature within the USSR Ptitseprom system from 0.9 billion rubles to 8.4 billion rubles in 1978, or by a factor of 9.3. During this period, everything that had originally been accepted into the system was subjected to radical modernization and expansion. In addition, more than 600 new farms were built.

A great amount of work associated with the technical re-equipping of the branch was carried out simultaneously with this construction. Within a brief period of time, series production was organized for the principal technological equipment. Since 1965 the poultry raising enterprises have been supplied with approximately 200,000 banks of cages, more than 5,000 incubators, slaughtering lines, egg sorting machines and ventilation-heating and other types of equipment.

The equipping of industrial farms with new types of technological equipment made it possible to raise the mechanization level for the principal labor-consuming processes and increase labor productivity. Thus the mechanization level for the watering of adult poultry was raised by 97 percent and for the issuing of feed -- to 90 percent, for the removal of excrement -- to 75 percent and complete mechanization -- to 75 percent. The proportion for the technology employed in the cage maintenance of egg laying poultry was raised to 96 percent. The conversion of poultry over to cage maintenance made it possible, at all of the sites, to increase egg production by a factor of 2-2.5 and to lower labor expenditures by 25-30 percent. Labor productivity for the branch as a whole increased by more than fourfold and wages increased by twofold.

The conversion of poultry raising over to an industrial basis required the development of a basically new technology, methods for the dry feeding of poultry, new forms for organizing and operating poultry raising farms and so forth.

In this regard, a great amount of work has been carried out in connection with studying the experience of intensive poultry raising operations in various capitalist countries and summarizing the leading experience of the best domestic farms. It was on this basis that the Soviet scientist-poultry raisers, during a comparatively brief period of time, developed and introduced into production operations new methods of selection, which during the past few years served as the basis for the creation of highly productive domestic poultry crosses, methods for the establishment of norms for the feeding of poultry according to a complex of nutrients and state standards for mixed feeds, which ensured the conversion over from damp to dry feeding of poultry; methods and programs for complete control over productivity (parameters for temperature and humidity, ventilation norms, specialized raising of replacement young stock, artificial moulting of laying hens and so forth), a technology for the maintenance of various types of poultry in banks of cages and scientifically sound requirements for the design of appropriate types of equipment; principles for organizing production associations and interenterprise cooperation in poultry raising; effective measures for combating the more dangerous infectious diseases of poultry and also measures for preventing these diseases.

The scientists at the All-Union Scientific Research Institute of the Poultry Processing Industry made a considerable contribution towards the development of industrial poultry raising throughout the country. As early as the 1930's, scientific studies were carried out at the institute aimed at developing a technology for the production of eggs and poultry meat on public farms and for the industrial processing of poultry raising products at poultry combines. For a long period of time the institute was the first and only scientific institute in the country engaged in the development of a new technology for the cage maintenance of poultry. The scientific studies carried out by the institute provided the base for the development of recommendations on organizing the production of eggs and poultry meat on an industrial basis throughout the country.

Simultaneous with the introduction into production operations of new and progressive developments, a great amount of work was carried out in connection with production specialization and concentration. As a result, the average capability of a farm within the USSR Ptitseprom system, in terms of the number of adult poultry, increased from 44,000 head in 1965 to 138,000 in 1978, that is, by more than threefold. At the present time, there are 99 associations engaged in the production of eggs and poultry meat throughout the country. These associations include 365 farms of USSR Ptitseprom -- 28 percent of their overall number. In addition, 303 kolkhoz and sovkhoz farms and IPS's [incubator poultry-raising stations] are participating in interenterprise cooperation. As a result of production specialization and concentration at the poultry raising associations, improvements have been achieved in the quality and economic indicators. The egg production at the associations is considerably higher than the average for the country and labor and feed expenditures per 1,000 eggs are lower by 8 and 4 percent respectively.

The implementation of a complex program for the construction and technical re-equipping of poultry raising farms, the extensive introduction into operations of scientific achievements and leading experience and intensified production specialization and concentration made it possible to intensify the branch in a rapid manner, achieve considerable growth in the number of poultry, raise their productivity, increase the production and procurement volumes for poultry products, improve all of the branch's economic indicators and raise the efficiency of its operations.

The data furnished in the tables (Tables 1 and 2) reveals that the production and procurement volumes for eggs and poultry meat increased considerably during the past few years. Moreover, almost this entire

Table 1

Indicators	State Procurements and Poultry Production Output by Years			
	1965	1970	1975	1979
Number of farms in system	576	992	1145	1319
USSR Ptitseprom, in addition to incubator poultry-raising stations	1067	897	631	533
Egg production, in billions of units				
All categories of farms	29.1	40.7	57.5	65.6
Including the public sector	9.5	19.0	34.8	43.9
Of which number, USSR Ptitseprom farms	3.2	10.7	25.5	37.0
Production of poultry meat, thous. of tons				
All categories of farms	880	1354	1938	2552
Including the public sector	268	529	992	1539
Of which number, USSR Ptitseprom farms	98	294	676	1223
State procurements of eggs, in billions of units				
Total	10.5	18.0	33.1	41.0
Including the public sector	7.8	16.1	31.1	39.7
Of which number, USSR Ptitseprom farms	2.8	9.7	23.4	34.2
State procurements of poultry meat, thous. of tons				
Total	210.3	446.4	904.3	1457.7
Including the public sector	205.6	442.2	900.1	1453.2
Of which number, USSR Ptitseprom farms	89.1	279.8	654.8	1216.0
Ptitseprom proportion of poultry product procurements	42.0	63.0	72.4	83

increase was obtained at farms belonging to the Ptitseprom system. In particular, it should be emphasized that in 1979 the farms belonging to the Ptitseprom system accounted for 83 percent of the total amount of egg and poultry meat procurements.

In addition to increased production output, sharp improvements were also realized in the economic efficiency of the work being carried out at the poultry raising enterprises. Thus, compared to 1965, the egg production of laying hens on farms subordinate to USSR Ptitseprom increased from 158 to 214 eggs during 1979, labor expenditures for the production of 1,000 eggs decreased from 16 man-hours to 3 man-hours, or by a factor of 5.2, and for the production of 1 quintal of weight increase the labor expenditures decreased from 44.6 to 13.2 man-hours, or by a factor of 3.4. Feed expenditures for the production of 1,000 eggs dropped from 3.9 to 2.07 quintals, or by a factor of 1.9, and for the production of 1 quintal of weight increase -- from 8.5 quintals to 7.06 quintals, or by a factor of 1.2.

The farms belonging to the USSR Ptitseprom system have been transformed into highly efficient and profitable enterprises. From 1965 until 1979, 11.3

Table 3

Principal Economic Indicators for USSR Ptitseprom	1965	1970	1975	1979
Egg production of laying hens, units	158	199	227	214
Labor expenditures, in man-hours				
Per 1,000 eggs	16.0	7.5	4.2	3.1
Per quintal of weight increase in				
meat of hens	44.6	30.9	18.9	13.2
meat of broilers	-	10.9	7.3	6.3
Feed expenditures, in quintals of feed units				
Per 1,000 eggs	3.9	2.9	2.06	2.07
Per quintal of weight increase in				
meat of hens	8.5	8.18	7.06	7.06
meat of broilers	-	4.64	4.22	4.29
Production cost, in rubles-kopecks				
For 1,000 eggs	72-34	61-86	58-50	59-68
For 1 quintal of weight increase in				
meat of hens	141-00	172-10	184-98	181-33
meat of broilers	-	102-68	113-77	152-00
Gross output, in millions of rubles	954*	1984*	4189**	6000**
Profit, in millions of rubles	39.1	576.5	937.2	1500
Profitability, %	10	33	28.6	29

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* In 1965 prices
** In 1973 prices

billion rubles worth of profit were earned at these farms. This means that the capital investments for production construction work were repaid by 94 percent during this period. The gross production profitability for poultry raising products increased from 10 percent in 1965 to 29 percent in 1978. During 1979 alone, the gross agricultural output produced at Ptitseprom farms amounted to 6 billion rubles.

Within the system there are many large-scale enterprises having production activity indicators which are considerably higher than the branch indicators. For example, in 1979 the collective at the Borovskiy Poultry Factory in Tyumenskaya Oblast produced 425 million eggs and obtained 251 eggs from each laying hen. Approximately 1.56 quintals of feed units of feed and 1.65 man-hours of labor were expended for 1,000 eggs and the production cost for 1,000 eggs amounted to 37 rubles and 30 kopecks.

Similar results were obtained at the Minsk and Kiev production associations for poultry raising, the Tallinn, the Shchukinskaya Poultry Factory (Kokchetavskaya Oblast), the Semipalatinsk Poultry Factory and others. Many examples could be cited describing the work being performed by the broiler poultry factories. For example, in 1979 the Vil'nyus Poultry Factory raised 3.3 million broilers. The average weight of a broiler slaughtered at 58 days of age was 1,780 grams, the feed expenditures per quintal of weight increase were 2.12 quintals, labor expenditures -- 2.8 man-hours and the production cost -- 77 rubles for 1 quintal. From 1 square meter of poultry house floor area, 126 kilograms of poultry meat were obtained. These were high indicators. Similar results were obtained by other poultry factories: Belozovka in Krasnoyarskiy Kray, Kekava in the Latvian SSR, Petelinskaya in Moscow Oblast, Lomonosovskiy and Russko-Vysotskaya in Leningrad Oblast, Smolevichi in Minskaya Oblast and many others.

The growth in the production and procurements of poultry products made it possible to bring about improvements in the supply of eggs and poultry meat for the country's population.

In 1979, 232 eggs and 7.6 kilograms of poultry meat were produced per capita, compared to 117 eggs and 2.6 kilograms of meat in 1964.

The above underscores the fact that the problem of supplying the population of our country with eggs can be solved in the immediate future. However, the problem confronting our branch with regard to supplying the population with poultry meat continues to remain acute and a great amount of work is being carried out at the present time aimed at correcting the existing situation.

In 1977, the CPSU Central Committee and the USSR Council of Ministers adopted a decree on measures for increasing the production of poultry meat. In this decree, a maximum amount of attention was focused on broiler production as the most effective and profitable branch of poultry raising.

In conformity with this decree, the production of poultry meat in the public sector must be raised to 2 million tons by 1980, including up to 894,000 tons of broiler meat. Of this quantity, 1.54 million tons must be produced by the farms of USSR Ptitseprom, including 793,000 tons of broiler meat.

The figures set forth in the decree reveal that the party and government have assigned a difficult task to the poultry raisers. The rapid development of broiler production requires the use of large capital investments for the construction of new and the modernization of old poultry factories specializing in the production of meat. The plans for the current five-year plan call for the placing in operation of 19 poultry factories representing an overall capability of 347 million broilers annually and 90 breeding farms for 4.01 million head of adult meat-type poultry.

In addition to the construction of new enterprises, special attention will be given to improving the utilization of existing capabilities for the production of poultry meat, capabilities which are available at operating farms. At the present time, the leading broiler enterprises are raising their density for chicks per square meter of floor space from 12 to 18-20 head. This is making it possible to increase the volume of meat per square meter of poultry house floor space, lower the production costs and increase profit and production profitability.

The conversion over to a technology for the cage maintenance of broilers is also considered to be of considerable importance with regard to improving the utilization of production capabilities.

An analysis of the operations of broiler factories throughout the country reveals that cage maintenance possesses an advantage over floor maintenance in terms of a majority of the principal economic indicators. In the case of the cage maintenance technology, the weight increases for the broilers are as a rule 11 percent higher and the feed expenditures and production cost for the meat are 15 and 12 percent lower respectively than the figures for floor maintenance. The period for raising broilers is reduced by 8-10 days. In 1979, more than 20 percent of the broilers were raised using the cage maintenance technology.

Future plans call for greater numbers of broilers to be raised using the cage maintenance technology. This will be promoted to a considerable degree by the organization of the production of new technological equipment.

In summarizing the above, it should be noted that notwithstanding increases in the production and procurements of eggs and poultry meat in recent years, the increasing demand of the population for poultry products is still not being satisfied completely and especially in the case of poultry meat. The production of eggs and poultry meat in the republics of Central Asia and the Trans-Caucasus, in a number of oblasts and krays in Eastern Siberia and the Far East and in certain other regions of the country are still lagging considerably behind the consumption norms. As a result, considerable quantities of eggs and poultry meat are still being imported into these regions of the country.

In the interest of ensuring that the population is supplied with eggs and poultry meat during the next few years in keeping with a scientifically sound norm, the plans call for further intensification of the production of these products through the technical re-equipping and expansion of farms within the Ptitseprom system and also through the new construction of large-scale poultry factories specializing in egg and meat production in those regions of the country lacking sufficient capabilities.

Growth in the production of poultry meat will be achieved mainly through the development of broiler poultry raising combined with more extensive inter-enterprise cooperation.

The labor collectives of poultry raising farms throughout the country are making extensive use of scientific achievements and the operational experience of leading enterprises and they are fully resolved to carry out the socialist obligations adopted for 1980 with regard to the production and procurements of poultry products, ensure ahead-of-schedule fulfillment of the plans for the Tenth Five-Year Plan and make a worthy contribution towards improving the supply of highly valuable food products for the population.

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AGRO-ECONOMICS AND ORGANIZATION

MEAT, VEGETABLE PRODUCTION IN CHELYABINSKAYA OBLAST PERSONAL PLOTS

Moscow IZVESTIYA in Russian 23 Sep 80 p 2

[Article by V. Ishchenko, chairman of the executive committee, Korkino City Soviet of People's Deputies, Chelyabinskaya Oblast: "The Private Plot -- A Great Help for City Dwellers"]

[Text] Our city of Korkino is sort of divided into two parts: the basic part, with multistory buildings, and the so-called personal sector -- farmsteads with wooden and stone structures, orchards, and vegetable gardens. That circumstance predetermined the traditional combination of the labor performed by the miners, automobile workers, construction workers, and cement workers with the work in their own personal plots.

Whereas in 1971 they sold 121 tons of meat through the local market and 164 tons in 1977, they sold 257 tons in 1979. We should add to that 50-60 tons of pork that was received by the ORS [department of workers' supply] hog-fattening points that operate on garbage. Then we will understand that the people of Korkino have a substantial amount added to the commercial meat funds.

The executive committee of the city's Soviet of People's Deputies does everything to encourage the development of the personal plots. Take, for example, the animal-husbandry association that has existed in the city for many years. It includes more than 5000 persons, who maintain more than a thousand head of cattle, 2,500 hogs, approximately 1000 sheep and goats, and 15,000 chickens. The association provides its members with feeds and fodders, makes plans involving the pastures and hay-mowing areas, and provides veterinary and zootechnical services for the livestock and poultry.

The executive committee, jointly with the managers of the city's enterprises, developed steps to reinforce the personal plots and to assure the further development of orchard-growing and vegetable gardening. Today every fifth family has a plot in the suburbs. Some people are attracted by the physical labor in the fresh air, others by the desire to grow their own early vegetables, or to grow flowers or a certain variety of apple. The enthusiasts of orchard-growing and vegetable gardening also are creating a tangible "vitamin" support, by providing berries, vegetables, and fruits not only to their own families, but also to other citizens.

In accordance with a decision of the executive committee, one of the city's organizations is assigned as a sponsor for each collective garden. The sponsors give assistance in maintaining the approach roads in proper order and provide the gardens with water for irrigation, electrical energy, and various materials.

Take the following example. The Korkinskiy Coal Pit, which is managed by I. Alonin, was quite recently assigned a vacant lot on which a collective garden was to be created. The leadership of the coal pit looked for ways to help and assigned equipment and specialists to carry out the laying out of the sector, the drainage operations, and the hauling in of a fertile layer of soil. Currently the existing 185 hectares of well-cared-for orchards and vegetable gardens have been augmented by an additional cultivated plot that was reclaimed from a swamp.

Last year alone the amateur orchard-growers bought 30 tons of mineral fertilizers, 50,000 bricks, 195 tons of cement, 146,000 shingles, 17,000 square meters of soft roofing materials, hundreds of cubic meters of construction lumber. . . . In order to help the orchard-growers and vegetable gardeners, the city's enterprises have worked out the problems of producing watering cans, soil-cultivating tools, and glass jars for canning.

I think that convincing arguments have been cited here in favor of developing subsidiary plots in a small city. But can we say that we are using all our internal reserves to provide the city dwellers with foodstuffs in the manner that is required today? The answer, unfortunately, is "no." For example, the increase in the number of head of livestock and poultry for personal use has not been as rapid as one would like. The main reason for this is that there is no reliable fodder base. The feeds and fodders received from the state fund cover only a part of the need. Under these conditions the executive committee is taking steps that are capable of correcting the situation. And I think that they are effective.

Take, for example, the recultivated land around the worked-out shafts. It is still too risky to use them for the purpose of civil or industrial construction, but the attempt to bring in the harvest last year yielded a rather good result. The animal-husbandry association, which has a tractor and tools for cultivating the soil, is capable of sowing and harvesting crops on an area of 40-50 hectares! In the long view, the area of the recultivated land will be approximately 300 hectares, and most of that area can be successfully used for fodder crops. That will make it possible to satisfy the demand almost completely.

But it is necessary to state one stipulation here. This situation can be achieved only if the technical support of the association is reinforced. For the time being, they have the right to purchase only actual horsepower

-- live draft animals. For everything else, the regulation on associations, which was adopted -- would you believe? -- in 1946, imposes a veto. Therefore the technical means of our animal-husbandry association, which I have mentioned, were purchased, so to speak, at their own risk and peril. Obviously, the time has come to eliminate that misunderstanding.

5075
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TILLING AND CROPPING TECHNOLOGY

GRAIN CROP DEVELOPMENT IN VIRGIN LANDS OF KAZAKHSTAN, SIBERIA

Moscow PRAVDA in Russian 19 Aug 80 p 2

[Article by A. Barayev, director of the All-Union NII [Scientific-Research Institute] of Grain Management, VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin] academician, Hero of Socialist Labor, Tselinogradskaya Oblast: "An Important Reserve: Problems and Judgments"]

[Text] In the southern regions of the country, the harvesting is at its peak, and in the virgin-land oblasts of Kazakhstan the grains are ripening. Despite the small amount of precipitation during the summer months, the grain harvests are becoming increasingly stable and the grain-growers have been depending less and less on the caprices of nature.

The conditions for vegetable husbandry in Northern Kazakhstan and Western Siberia are extremely severe. Suffice it to state that, out of every five years, two are years in which there is an acute drought. On the vast areas of Kustanayskaya, Turgayskaya, Pavlodarskaya, and other oblasts less than than 200 millimeters of precipitation falls during certain years. However, the drought in the territories here should not be considered a natural calamity -- it is a normal phenomenon. It is the task of science and production to develop methods to overcome its pernicious nature.

Our institute, from the very first day of its creation, has engaged in searching for, refining, and, finally, introducing a virgin-land system of vegetable husbandry, which currently has been given the name of a soil-protecting system. If one looks back into history, one can see the following natural law: the more rapidly the farm, rayon, or oblast has assimilated the methods recommended by science, the more stable the increases in the harvest have been and the less tangible the effect of the dry winds has been.

In confirmation of what has been stated, one can cite the following example. During the Eighth Five-Year Plan, as compared with the Seventh, in Tselinogradskaya Oblast the harvest yield of grain crops increased by two quintals, in Kokchetavskaya Oblast, 3.6 quintals. In the Ninth Five-Year

Plan the increase proved to be identical -- 1.8 quintals. On the average for the first four years of the Tenth Five-Year Plan, the harvest yield was, respectively, 11.6 and 12.9 quintals. In Pavlodarskaya Oblast, which suffered most from wind erosion during the first years of the assimilation of the virgin lands, a considerable increase was also achieved. It is very important to emphasize that the "peaks and valleys" in the harvest have noticeably leveled out.

The essence and principles of the soil-protecting system of vegetable husbandry during the period of its establishment and introduction have been repeatedly discussed in literature, so that the specialists in all regions of the country are familiar with it. To put it briefly, they can be summarized as the treatment of the soil with flat-cutter cultivators and other anti-erosion equipment that makes it possible to retain the stubble on the surface of the ground. The stubble limits the erosive action by the dust storms that carry away thousands and thousands of cubic meters of humus.

Soil-protecting vegetable husbandry stipulates the mandatory existence of bare fallow in crop rotations, their placement in strips alternating with grain crops or perennial grasses. Heated discussions have been devoted to this problem in our country, and they are still continuing. Incidentally, there is no uniform view concerning the problem on the part of the production experts in the virgin-land oblasts. For example, in Kustanayskaya Oblast, where smaller areas have been set aside as bare fallow than in the neighboring oblasts, the average harvest yield during the first four years of the Tenth Five-Year Plan, as compared with the Eighteenth, rose by only 0.5 quintals. As for the Ninth Five-Year Plan, the amount harvested here, as compared with the Eighth, has 2.7 quintals less per hectare. Severo-Kazakhstanskaya Oblast can serve as an opposite example. There approximately 20 percent of the plowed areas are occupied by bare fallow, but the harvest during the current five-year plan constituted 16.2 quintals per hectare. With the favorable conditions in 1979, the vegetable husbandrymen produced 18.3 quintals of grain on each of 1.7 million hectares.

As has been shown by research conducted by our institute, the highest harvest of wheat and its highest production are guaranteed by the four-field crop rotation, in which one field is bare fallow. Moreover, the average harvest yield for wheat during the first four years of the five-year plan on the institute's experimental farm came to 19.5 quintals, and the output of grain per hectare of plowed land, 14.7 quintals.

If it is necessary to produce fodder grain, five-field crop rotations are more productive (15.6 quintals per hectare of plowed land). Close to animal-husbandry complexes, it is best to introduce fodder crop rotations, excluding them from the field crops.

In regions subject to severe drought, a factor that takes on very great importance is the effective accumulation of the winter precipitation on the fields and the abundant moistening of the entire root-filled layer of the ground by using the water from melted snow and ice. Two- or three-time snow retention, as has been shown by many decades of observations, makes it possible to create a height of snow cover on the fields of as much as 40 centimeters, which is equal to 1,200-1,400 cubic meters of water per hectare.

At the present time, non-plow cultivation of the soil is being carried out on 35 million hectares, and stubble drills are sowing more than 36 million hectares. It has been computed that every year the country receives additionaly, by means of this procedure, approximately 5-6 million tons of grain. People in practical life and scientists see the advantages that the soil-protecting system has over classical vegetable husbandry.

I would like to cite several examples. At the beginning of the 1970's, I was invited to give a talk in Kiev. After my paper was read, approximately 30 questions were asked. The meaning of the questions can be summarized as, "Should people everywhere be plowing without a moldboard?" "Try it and see," I advised them them. "Get your results and then we'll see whose side the truth is on."

The experiments continued. On the Novoodesskiy Experimental Plot, Nikolayevskaya Oblast, on the average for seven years, on bare fallow, winter wheat with non-plow cultivation yielded 56.3 quintals per hectare, or 5.4 quintals more than with ordinary plowing. But the average increase for Novoodesskiy Rayon during that period came to approximately 4 quintals.

It might be that someone will consider that fact to be untypical. I would like to cite another example. On the Progress Kolkhoz, Poltavskaya Oblast, during the years 1973-1979, the average harvest of grain crops with non-plow cultivation was 48.1 quintals per hectare, or 7.6 quintals more than with traditional cultivation. On the Bil'shovits'ka Pratsya Kolkhoz during those years the average harvest was 51.5 quintals of grain, or 5.2 quintals more than with cultivation by plow.

Relying upon this and other data, the Poltavskaya Oblast Committee of the Communist Party of the Ukraine took a sharp course aimed at the introduction of soil-protecting vegetable husbandry. There, in 1979, non-plow cultivation was carried out on almost a million hectares. Under drought conditions, the grain-growers harvested 20.2 quintals of grain per hectare. That is more than in the neighboring Khar'kovskaya Oblast -- by 2 quintals more.

Good results were demonstrated by the experiments in the Volga area, the Southern Urals, and Northern Caucasus. However, our institute, which, since 1969, has been carrying out the coordination of research on protecting soils from wind erosion, obviously does not recommend the blind copying of the methods that were developed under virgin-land conditions. The task of the scientific institutions and practical experts lies in improving the methods, as applicable to the local soil and climatic conditions, and as applicable to the scientifically substantiated crop rotations and the crops being grown. But there does remain one absolutely mandatory condition -- the refusal to cultivate the soil with moldboard plows.

I must admit that the introduction of the soil-protecting system of vegetable husbandry involves unavoidable difficulties. I would mention first of all the prejudice on the part of of certain scientists and party and economic managers. We know, for example, of the following incident. Tests were carried out in one of the oblasts in the Chernozem Center. The result seemed to have been rather good, but not the result that had been counted on -- soil-protecting vegetable husbandry is not, in and of itself, a panacea to cure all sicknesses. The farm held a seminar. At that seminar the oblast managers literally said the following: "Have you become acquainted with it? Well, forget it -- this system isn't suitable for us." Then, in essence, all the experiments ceased. Although many fields and entire rayons had been subjected to wind erosion there.

The example cited is an extreme expression of underevaluation, and, perhaps, shortsightedness on the party of the managers upon whom the fate of the introduction of innovations depends. In principle, no one should accept things simply on faith, but sometimes caution crosses over the border and becomes overcautiousness. We are against that kind of situation. Every manager, every agronomist must take a certain amount of risk, unless he wants to remain aloof from that which is advanced.

Another problem that has confronted us and still confronts us is the shortage of anti-erosion equipment. As of today, this has been a deterrent to the broader application of the system of vegetable husbandry that has been worked out by the institute. Steps were taken long ago to assure the increase in production of anti-erosion equipment. Since 1962, more than 200,000 stubble drills alone have been produced. One would think that that's a rather large amount, but even during the present spring, farms in Kazakhstan sowed approximately 5 million hectares with seed drills. Requisitions for stubble drills are coming in from all parts of the country. However, the only plant that manufactures them, the Kazakhsel'mash Plant, cannot satisfy them by even three-fourths. The situation is exactly the same with regard to the production of flat-cutter cultivators, needle harrows, and other cultivation equipment.

In our opinion, inasmuch as the zone of soil-protecting vegetable husbandry is expanding and that of classic husbandry, naturally, is being reduced, it is necessary to reduce in the corresponding proportion the production of disk drills and plows, and to increase the production of anti-erosion equipment. At certain plants one should organize special sectors responsible for producing simple machinery or assemblies for anti-erosion equipment. Then they can be transformed into shops.

The shortage of equipment is obviously restraining the comprehensive introduction of soil-protecting vegetable husbandry even in its homeland. As has been shown by many years of research, in the northern oblasts of Kazakhstan, Western Siberia, and the Southern Urals, the highest harvest of spring wheat, all other farm conditions being equal, is obtained when it is sown from 15 through 25 May; and barley and oats, in late May or the first five-day period of June. But these deadlines, as a result of the shortage of drills, are not being met on a number of sovkhozes and kolkhozes, as a result of which there has been a drop in the harvest yield.

When the assimilation of the virgin lands began, Kazakhstan was given the task of annually producing no less than 8 quintals of grain per hectare. That task was resolved long ago. At a solemn meeting in Alma-Ata in 1974 Comrade L. I. Brezhnev expressed the desire to raise the harvest yield in the republic to 20 quintals. Already not only individual farms, but also a number of rayons have exceeded that indicator. I am convinced that if the soil-protecting system of vegetable husbandry is introduced everywhere and if there is a universally high level of agrotechnology and the providing of the sovkhozes and kolkhozes with a sufficient quantity of mineral fertilizers, the assigned goal will be achieved by everyone.

I would like to discuss mineral fertilizers in a special manner. Our research has completely refuted the established opinion concerning the low effectiveness of the rayons that are subject to severe droughts. For example, when administering phosphate fertilizers at the rate of 20-30 kilograms of effective substance per hectare, the increase in the harvest of grain crops reaches 4 quintals. In addition, the ripening of the grains is speeded up by one week, thus making it possible to harvest them when the weather conditions are better and to avoid any losses. According to our computations, the administering of this amount of fertilizers will make it possible for Kazakhstan to produce additionally as much as 5 million tons of strong wheat. The planning agencies should think a little bit about these computations.

An important reserve for increasing grain production in Kazakhstan and Siberia is the changeover to the sowing of varieties of grain crops that have a higher harvest yield and are adapted to the local climate. The workers at our institute have developed a new variety of barley -- Tselinnyy-5. It produces a harvest that is larger than the varieties that were previously cultivated, and it is drought-resistant. But its greatest advantage is that the grain contains 16-18 percent protein. This barley should become the basic concentrate for all types of livestock. A good variety of wheat has also been created -- Tselinnaya-21. Now it is a matter of the rapid multiplication of the new varieties. That depends primarily upon the production workers.

Like no other system, soil-protecting vegetable husbandry has established its right to existence after much difficulty, and, like no other system, is now rapidly finding proponents and broad dissemination. Its further introduction is an important reserve for increasing the gross harvest of grain.

5075
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TILLING AND CROPPING TECHNOLOGY

HISTORY OF NONCHERNOZEM CEREAL CROPS RELATED

Moscow SEL'SKAYA NOV' in Russian No 8, Aug 80 pp 12-13

[Article by VASKhNIL Corresponding Member E. Nettevich: "Grain Fields of the Nonchernozem Zone"]

> [Text] The party has planned and is successively implementing an integrated program of agricultural development of the RFSFR's nonchernozem zone. Breeders are taking an active part in this great work, creating new intensive varieties of cereal crops for the nonchernozem zone.

Rye and oats have been the staple of the nonchernozem farmer since ancient times. The most undemanding of these crops took everything that the impoverished, rain-stripped podzolic soil could give. The average grain yield of the nonchernozem zone prior to Great October was 30-40 poods. In the best years it came close to 60 poods, but more often than not, it dropped into the 20's or 30's. In years of bad harvests, the peasant was unable to retrieve even what he had sown.

Wheat, a more demanding crop, produced even lower yields. This is why it was hardly planted at all. In 1913 wheat occupied a little more than 250,000 hectares of the vast territory of the nonchernozem zone. Only 30,000 hectares were devoted to this crop in 12 central provinces. These were miserly islets in a sea of winter rye and wheat. Wheat was sown mainly by the landowners. It was out of the reach of the peasants. Only the most prosperous peasants reserved plots for it in their gardens, so as to have white buns for the holidays. Winter wheat was thought to be an unreliable crop, while spring wheat produced a yield much lower than that of rye and oats. It is no accident that only 1.7 percent of the total grain growing area of central Russia was devoted to these two crops prior to the revolution.

During the first years of Soviet rule attention was naturally concentrated mainly on improving the basic crops of the nonchernozem zone--rye and oats, as well as buckwheat, which occupied significant areas in a number of oblasts. Owing to the efforts of the talented breeders P. I. Lisitsin, N. V. Rudnitskiy, and others, the first domestic varieties of winter wheat were created--Lisitsina and Vyatka. Bred out of local forms, they were noticeably superior to them in yield, grain size, and other commercially valuable characteristics. The famous buckwheat variety Bogatyr' reached the fields simultaneously with this rye. Local varieties of oats were also improved. The first varieties of cereal crops that were bred promoted a certain increase in the zone's yields, but they did not alter the sowing structure.

Efforts to breed wheat for the nonchernozem zone proceeded less successfully. Attempts by D. L. Rudzinskiy and S. I. Zhegalov at Moscow to create a spring wheat variety ended in failure. The experimental crops were completely killed off by the Swedish fly. This little-noticeable shiny black fly, only 1.5-2.0 mm long, first described by the Swedish scientist C. Linnaeus, mercilessly killed the young spring wheat plants. The islets of wheat within the sea of oats served as bait, as an enticement to the insect. This failure led the well known breeders to the conclusion that further efforts at breeding spring wheat were unsuitable. For a long time the nonchernozem zone was thought to be unsuited to this crop. This notion did not disappear until recent decades.

Tremendous changes came about in the country's agriculture by the end of the First Five-Year Plan. Large agricultural enterprises--kolkhozes and sovkhozes--were organized in place of the small peasant farms. Industry developed at a swift pace. Considering the relatively favorable climatic conditions of the nonchernozem zone, the party posed the task of creating a large commercial grain growing region in this zone, around the industrial cities. Broad and swift introduction of spring wheat to the fields of the nonchernozem zone began at this time. By as early as 1938 it occupied 2.5 million hectares. Its planting rate increased tenfold in most oblasts.

Once spring wheat began to be planted over an area of millions of hectares, it ceased to be the object of the "main strike" of the Swedish fly. The efforts of the latter were dispersed over a tremendous area, which allowed the new crop to assert itself within the first years. The attention farmers devoted to spring wheat also promoted this.

The difficulties that did exist were caused by the absence of local varieties. Only Volga, Siberian, and Ukrainian varieties were available. Having their origins in such remote places, they were not very well suited to the specific conditions of the nonchernozem zone. But there was no other solution at the moment. Local spring wheat varieties appeared here much later; they were created by V. Ye. Pisarev, A. V. Navolotskiy, and others. Foreign varieties also filled the vacuum temporarily.

Attempts were subsequently made to increase the area devoted to winter wheat in the nonchernozem zone. But these attempts did not enjoy much success. The low agrotechnical level and the low productivity of the varieties prevented this crop from achieving recognition over a broad area in the 1940's.

Thus winter rye and oats continued to dominate the nonchernozem zone in the prewar years and in the first postwar years. Spring wheat occupied a significant area.

Noticeable changes in the structure of the grain fields of the nonchernozem zone made themselves known after the March (1965) Plenum of the CPSU Central Committee. By this time, farming practices had improved and the yields increased. The demand for particular types of grain changed as well. Production of dietary grain shifted to the country's eastern regions, where millions of hectares of virgin and waste lands were developed. Animal husbandry, which was shifting to an industrial foundation, created a higher demand for feed grain. This process inevitably caused change in the structure of the grain fields of the nonchernozem zone. Its rate increased even more after the CPSU Central Committee and the USSR Council of Ministers published the decree "On Measures for Further Development of Agriculture in the RFSFR's Nonchernozem Zone" (1974).

More-productive feed grain crops began to assume a visible place. Barley "seized" the lead among them. Prior to this, it was treated as one of the zone's secondary crops. The barley fields were small in size. As an example barley occupied only 154,000 hectares in Tsentral'nyy Rayon in the late 1950's. Barley was hardly grown at all in a number of oblasts.

But in 1979 it already occupied 3 million hectares in this region. In sum total, barley occupied 42 percent of the grain growing area in the nonchernozem zone--6.7 million hectares.

Breeding played an important role in expansion of the barley growing area. The productive Moskovskiy 121 variety was created; it displaced the old Viner variety, which had served the farmers well for an entire half-century. New, even more productive domestic and foreign varieties were regionalized in subsequent years--Krasnoufimskiy 95, Luch, Elgin, Nadya, and others.

What was it about this crop, which had been so unassuming before, that suddenly attracted so much attention? First of all its yields were high and stable. This property of barley began to reveal itself noticeably on the background of the general improvement of farming practices, reduction of planting time, and improvement of plant nutrition. Offering an advantage in yield, barley displaced other cereal crops--spring wheat, oats, and rye.

Oats suffered especially poor luck in the nonchernozem zone. At the beginning of the 1960's oats were ranked among the low-yield crops, which resulted in a dramatic reduction of the area devoted to this crop. It took years to restore its respectability. Even the breeding of this crop ground to a halt, which could not but have an effect upon its fate. It was only in the last few years that oats have been "reinstated".

The area devoted to spring wheat decreased by almost two times in the zone during the last 20 years, being inferior in yield to new barley varieties. The gap was significant. Barley's productivity was 30-50 percent above that of spring wheat in Tsentral'nyy, Volgo-Vyatskiy, and other rayons. Given such a ratio, cultivating spring wheat was unprofitable. All the more so because the prices set for all cereal crops, including rye, were identical.

It was only in the last 3-4 years, with the appearance of new varieties of spring wheat--Moskovskaya 35 and Leningradka--that the area devoted to this crop in the nonchernozem zone became stabilized at 1-1.3 million hectares. Owing to breeding successes, new varieties of spring wheat began to compete in yield with barley, while in a number of oblasts the yields took the lead over barley. The old spring wheat varieties had a yield ceiling of 30-35 centners per hectare, they were subject to intensive lodging, they were susceptible to diseases, and they reacted poorly to growth in soil richness. The potential yield of the new varieties attained 50-60 centners per hectare, and higher. Many farms of the nonchernozem zone that had switched to cultivation of Moskovskaya 35 and Leningradka noticeably increased their gross spring wheat harvest.

The results enjoyed by the well-known Novaya Zhizn' Kolkhoz in Tul'skaya Oblast are indicative. The farm harvested an average of 33.9 centners of Otechestvennaya spring wheat in 5 years, which was lower than the barley yield. But then this same kolkhoz began planting Moskovskaya 35 and Leningradka. The spring wheat yield reached 46.3 centners per hectare, which was more than the barley yield. The same pattern was observed in many farms of Tul'skaya, Ryazanskaya, Vladimirskaya, Gor'kovskaya, and other oblasts.

The winter fields of the nonchernozem zone also changed in recent decades. The area devoted to winter wheat grew noticeably. While in previous times the proportion of this crop in most oblasts of Tsentral'nyy Rayon was less than 10 percent, winter wheat now occupies a leading position. New varieties created by N. V. Tsitsin and G. D. Lapchenko promoted universal and swift expansion of the area devoted to this crop. Wheat-wheat grass hybrids No 599 and No 186 opened up extensive possibilities for growing winter wheat, broadening its growing area. Superseding them, Mironovskaya 808 strengthened the position of the main cereal grain even more. Winter wheat "invaded" almost a million hectares that had formerly been devoted to rye. It became a permanent citizen of Tsentral'nyy, Severo-Zapadnyy, and Volgo-Vyatskiy rayons. The eastward advance of winter wheat is being restrained by its insufficient winter-hardiness. Breeders will have the last word in this respect.

Concurrently with expansion of the area devoted to barley and winter wheat, a dramatic decline in the area devoted to winter rye proceeded in the nonchernozem zone. Despite advances in breeding practices, this crop's countenance and properties continued to remain almost the same. Judge for yourself: The long thin rye stem was subject to intensive lodging, and the better the farmer tended the crop, the more strongly this shortcoming revealed itself. The weakness of the straw was the cause. But breeders were unable to shorten it for a long time. It took many difficult years to reduce it by just a few centimeters. At this pace, the goal was too far away. Moreover a powerful combine could not deal with lodged grain. What happened in the end was that the combines were switched to fields of other crops, leaving the rye for the end of the harvesting season. Time "eroded away" the rye yield, which was low as it was.

While the yields of other cereal crops increased in the nonchernozem zone, the rye yield did not, and in a number of oblasts it even decreased. The erstwhile omnipotent cereal dropped more and more into disfavor. Poorer land began to be allocated to it, the planting schedule was violated, and little care was given to working the fields and applying fertilizer. Thus the circumstances came together to aggravate the already shaky position of winter rye. In the end, the area devoted to this crop in the nonchernozem zone decreased by a factor of three. The same pattern was also observed in the country as a whole.

But rye grain is needed. Rye became a topic of discussion in newspapers and scientific journals, and at conferences. Only the breeders could save the traditionally Russian crop. And they had to hurry. The new varieties they created--Voskhod 1, Gibrid 173, Leningradskaya Tetra, and Golubka--somewhat increased rye's yield and its resistance to lodging. With the advent of new varieties, farmers began planting rye more willingly. Many kolkhozes and sovkhozes increased the proportion of land devoted to winter rye at the expense of less-winterhardy wheat. A higher procurement price also stimulated production of winter rye. The state began paying more for rye than for wheat, barley, and oats.

However, a fundamental solution to the problem began to take shape only in recent times, with the discovery of short-stem donors for rye. Forms having a stem height two times shorter than that of varieties presently being cultivated were discovered. The donors of the short stem traits were themselves poor producers in our country. When crossed with productive varieties, they reduced the height of the latter. The resulting hybrids were not bad.

The Chulpan variety, created at a local scientific research institute by R. A. Kunakbayev, N. I. Leshchenko, and A. M. Vlasova, was regionalized for the Bashkir ASSR in 1979. Now this variety is recognized to be promising in a number of rayons of the nonchernozem zone as well. Chulpan straw is half a meter shorter than that of the old varieties, and the plants are resistant to lodging even when the ears are at their bushiest. Breeding centers of the nonchernozem zone are also close to perfecting varieties with strong stems. As an example the breeding center in Nemchinovka has already "fabricated" the Voskhod 1 and Voskhod 2 varieties. These varieties produce a high yield, and they are not subject to lodging.

As we can see, breeding plays an important role in improving the grain yields of the nonchernozem zone. The new varieties of winter and spring wheat, rye, barley, and oats have created a foundation for quickly raising the yield of all cereal crops. And this will permit us to determine the crop structure that is optimum for the oblasts and farms, with a consideration for their specialization and for the needs of the state.

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TILLING AND CROPPING TECHNOLOGY

USE OF AVIATION FOR AGRICULTURAL PURPOSES IN KAZAKHSTAN

Moscow VOZDUSHNYY TRANSPORT in Russian 26 Aug 80 p 1

[Interview with Mikhail Georgiyevich Motoriko, minister of Agriculture for the Kazakh SSR, by correspondent O. Dzyuba: "Generosity of the Kazakhstan Fields"]

[Text] Soviet Kazakhstan is today celebrating its 60th anniversary. During these years, this formerly backward outlying area of Russia has been transformed into a highly developed industrial and agricultural republic. The reclaimed virgin land is producing billions of poods of grain. During the period in which the republic was making preparations to celebrate the 60th anniversary of the founding of the Kazakh SSR and the Communist Party of Kazakhstan, our correspondent O. Dzyuba met with the Minister of Agriculture for the republic, Mikhail Georgiyevich Motoriko.

[Question] Is it not true, Mikhail Georgiyevich, that at one time it was possible to fly for hours over the Kazakhstan Steppe and view only silvery waves of feather grass through the portholes and from time to time flocks of sheep?

[Answer] The transformation of the virgin land steppes into fertile fields was accomplished by hundreds of thousands of loyal sons and daughters of our homeland, drawn from all of the union republics. Our party organized the mastering of the virgin land while taking full advantage of its inherent revolutionary ardor. Hundreds of virgin land sovkhozes appeared and scientific research centers and VUZ's were built on tens of millions of hectares. The virgin land region became a reliable grain area in the eastern part of the country. This created the conditions required for obtaining guaranteed yields.

[Question] At times, I have encountered some curious figures. Prior to the mastering of the virgin land region, Kazakhstan sold 50-70 million poods of grain to the state and even during the best crop years just slightly more than 100 million poods. Is it possible then that this region is presently supplying billions of poods of grain?

[Answer] The initial Kazakhstan billion poods of grain was delivered to the homeland in 1956. The republic was awarded the Order of Lenin for this labor accomplishment. However, a record yield was obtained last year by the grain growers. Approximately 1.26 billion poods of good quality Kazakhstan grain were sold to the state. All of the republic's oblasts overfulfilled their planned tasks for the sale of grain. The farmers of the virgin land region had made a decisive contribution.

[Question] There is just reason for taking pride in the considerable yields obtained in recent years. However, is it not true that the fertility potential of the generous Kazakhstan fields is far from being exhausted?

[Question] Obviously, our chief concern is that of grain production. For it is the grain that defines for the most part the level of all of our work. The republic's grain growers are confronted by a specific task: during the next few years, to raise the grain yield per hectare to no less than 20 quintals, that is, to achieve the goal established by the General Secretary of the CPSU Central Committee and the Chairman of the Presidium of the USSR Supreme Soviet L.I. Brezhnev. Many rayons in the virgin land oblasts are already obtaining 20 quintals or more per hectare. In 1979, 140 farms obtained yields ranging from 20 to 30 quintals per hectare. In order to achieve such considerable results, every attempt must be made to continue the persistent efforts aimed at utilizing the tremendous reserves available for further raising the cropping power.

[Question] Modern equipment is being made available to practically all of the agricultural branches. But what assistance is being furnished to the agricultural workers by our aviators?

[Answer] Without risk of exaggeration, I can state that aviation is truly providing us with invaluable assistance. The successes being achieved by our grain growers are dependent to a considerable degree upon constant chemical treatment of the fields. Each year, 14-15 million hectares are treated from the air for the purpose of preventing weed growth. Very little time is available in which to carry out this work, since it must be completed as a rule prior to the beginning of July. Efficiency and well thought out plans are required and I am happy to note that these qualities mark the actions of our airborne assistants. Particular importance is attached to top dressings being applied to the fields in the spring. And it is in this area that the aviators perform in an especially efficient manner.

It bears mentioning that our republic is dependent upon the results of their endeavors as never before. Let us consider a few figures. Approximately 1,000 aircraft are in operation at the same time in the skies over our fields during the summer.

One other factor should not be overlooked. In Kazakhstan, all of the agricultural branches rely heavily upon the assistance afforded by aviation.

You yourself have visited the virgin lands and in all probability have taken note of the fact that practically all of the farms are presently connected to the "great land" by means of aerial communications. Here we are touching upon the social importance of aviation. When a village is separated from the oblast center by hundreds of kilometers of snow-covered steppe, the people in that village rest assured that, if needed, an aircraft of medical aviation will appear at the right moment.

In short, I wish to emphasize that the aviators are our closest friends.

[Question] Are the shepherds out on distant pastures being furnished with any assistance in combating the bests of prey?

[Answer] Beyond any doubt. Despite the controversy aroused by scientists concerning the role played by wolves in nature, this beast of prey continues to be an evil and merciless enemy of agriculture.

The aircraft flying in the skies over our fields represent a component part of agricultural industrialization and they are furnishing highly needed support. During this jubilee period, as they look back upon the path already traveled and evaluate the results achieved, the republic's agricultural workers once again vow to devote a maximum amount of effort towards solving successfully those tasks established by the party with regard to further improving the country's agiruclture.

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CSO: 1824

TILLING AND CROPPING TECHNOLOGY

MEASURES FOR COMBATING WEEDS IN MOLDAVIAN SSR DISCUSSED

Kishinev SOVETSKAYA MOLDAVIYA in Russian 5 Aug 80 p 2

[Article by A. Lisovskiy, head of the Herbicide Laboratory at the Selektsiya Scientific Production Association: "A Cultivator and a Herbicide"]

[Text] Perennial root-sucker weeds, among which the Canadian thistle, way thistle, field sow thistle and field bindweed are found most extensively, lower the yields obtained from field crops to a considerable degree.

Included among the measures employed for preventing the spread of these weeds out on the fields, are: observance of the correct crop rotation plans and the alternation of crops out on the fields, the use of a scientifically sound system for treating the soil in conformity with the biological characteristics of the sown crops and their predecessor crops, thorough carrying out of the agrotechnical methods and measures for tending the crops, observance of the correct system for applying herbicides and the destruction of weeds on the shoulders of roads and on the private plots.

Way thistle and field bindweed are difficult weeds to eradicate; persistent measures must be carried out over a period of several years in order to suppress them. Such measures must take the form of a complex system consisting of both agrotechnical measures and chemical agents.

The first harvest is in progress. In this regard, on the fields from which the crops have been removed and on which there are many root-sucker weeds, cleaning operations should be carried out immediately following the harvest in the interest of removing the straw and chaff and disking work should be conducted in two tracks to a depth of 6-8 centimeters. During the formation of the sowthistle buds, 2.4-DA herbicide should be applied in a dosage of 4-5 kilograms per hectare (according to a formula), after first being dissolved in 300-400 liters of water. After 12-15 days have elapsed, shallow plowing should be carried out to a depth of 12-14 centimeters using plowing implements ganged with harrows or rollers. In the event of repeated sowthistle aftergrowth or the appearance of sprouts of other weeds and windfalls, cultivation is carried out to a depth of 8-10 centimeters. Towards the end of September and early October, autumn plowing should be carried out using rollers or harrows, to a depth of 32-25 centimeters for sugar beets and to 30 centimeters for the remaining spring crops. If corn, oats, barley or other grass crops are to be grown on such fields, their sowings should be treated with 2.4-DA herbicide (2-2.5 kilograms per hectare according to a formula).

The campaign against sowthistle and field bindweed, on fields set aside for winter wheat grown following winter and spring vetch, with grass crops, peas for grain, corn for green feed, alfalfa and grain crops (winter and spring), must consist of the following measures. Once the crop residue has been removed from a field, disking should be carried out to a depth of 6-8 centimeters. Thereafter and coincidental with the appearance of the sowthistle buds, 2.4-DA should be applied in a dosage of 4-5 kilograms per hectare according to a formula. After 10-12 days have elapsed, mouldboard plowing should be carried out to a depth of 25-27 centimeters using rollers or harrows. In order not to damage the winter crop seedlings, 2.4-D amino salt should be applied 3-4 weeks prior to the commencement of sowing operations.

During the spring, the winter wheat and barley sown on fields contaminated by sowthistle and field bindweed must necessarily be treated with the 2.4-DA preparation (2-2.5 kilograms per hectare) at the times indicated in the recommendations.

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